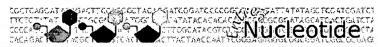
admitted prior out

page 10 concerning

Fig. 6





PubMed	Nucleotide	Protein	Genome	Structure	PopSet	Taxonomy	OMIM	Books
Search Nu	cleotide ▼ f	or	3 7 7	4 1945	100		Go Cle	ar
	Life Life	Limits	Preview/Ir	ndex Hi	story	Clipboard	De	tails

## 1: AE000261. Escherichia coli ...[gi:1787945]

Links

LOCUS AE000261 11033 bp DNA linear BCT 01-DEC-2000 DEFINITION Escherichia coli K12 MG1655 section 151 of 400 of the complete

genome.

AE000261 U00096 ACCESSION

AE000261.1 GI:1787945 VERSION

KEYWORDS

SOURCE Escherichia coli K12. ORGANISM Escherichia coli K12

Bacteria; Proteobacteria; gamma subdivision; Enterobacteriaceae

Escherichia.

REFERENCE (bases 1 to 11033)

**AUTHORS** Blattner, F.R., Plunkett, G. III, Bloch, C.A., Perna, N.T., Burland, V., Riley, M., Collado-Vides, J., Glasner, J.D., Rode, C.K., Mayhew, G.F.,

Gregor, J., Davis, N.W., Kirkpatrick, H.A., Goeden, M.A., Rose, D.J.,

Mau, B. and Shao, Y.

The complete genome sequence of Escherichia coli K-12 TTTLE

JOURNAL Science 277 (5331), 1453-1474 (1997)

MEDLINE 97426617 PUBMED 9278503

2 REFERENCE (bases 1 to 11033)

AUTHORS Blattner, F.R.

TITLE Direct Submission

JOURNAL Submitted (16-JAN-1997) Guy Plunkett III, Laboratory of Genetics, University of Wisconsin, 445 Henry Mall, Madison, WI 53706, USA.

Email: ecoli@genetics.wisc.edu Phone: 608-262-2534 Fax:

608-263-7459

REFERENCE 3 (bases 1 to 11033)

AUTHORS Blattner, F.R. TITLE Direct Submission

**JOURNAL** Submitted (02-SEP-1997) Guy Plunkett III, Laboratory of Genetics,

University of Wisconsin, 445 Henry Mall, Madison, WI 53706, USA.

Email: ecoli@genetics.wisc.edu Phone: 608-262-2534 Fax:

608-263-7459

REFERENCE 4 (bases 1 to 11033)

AUTHORS Plunkett, G. III. TITLE Direct Submission

JOURNAL Submitted (13-OCT-1998) Laboratory of Genetics, University of

Wisconsin, 445 Henry Mall, Madison, WI 53706, USA

COMMENT This sequence was determined by the E. coli Genome Project at the

> University of Wisconsin-Madison (Frederick R. Blattner, director). Supported by NIH grants HG00301 and HG01428 (from the Human Genome-

Project and NCHGR). The entire sequence was independently

determined from E. coli K12 strain MG1655. Predicted open reading frames were determined using GeneMark software, kindly supplied by Mark Borodovsky, Georgia Institute of Technology, Atlanta, GA, 30332 [e-mail: mark@amber.gatech.edu]. Open reading frames that have been correlated with genetic loci are being annotated with CG Site Nos., unique ID nos. for the genes in the E. coli Genetic

Stock Center (CGSC) database at Yale University, kindly supplied by Mary Berlyn. A public version of the database is accessible (http://cgsc.biology.yale.edu). Annotation of the genome is an

ongoing task whose goal is to make the genome sequence more useful

FEATURES

gene

CDS

gene

CDS

appreciated. Updated information will be available at the E. coli Genome Project's World Wide Web site (http://www.genetics.wisc.edu). \*\*\* The E. coli K12 sequence and its annotations are periodically updated; this is version M54. No sequence changes. Annotation updates: updated gene identifications and products; all new functional assignments courtesy of Monica Riley; added promoters, protein binding sites, and repeated sequences described in reference 1. The unique numeric identifiers beginning with a lowercase 'b' assigned to each gene (protein- or RNA-encoding) are now designated as gene synonyms instead of labels. This should allow them to be searched for in Entrez as gene names. Location/Qualifiers 1..11033 source /organism="Escherichia coli K12" /strain="K12" /sub strain="MG1655" /db xref="taxon:83333" protein bind <1..2 /note="central position to predicted promoter: -44.5" /bound moiety="RhaS predicted site" promoter /note="factor Sigma70; promoter sodB; documented +1 at1733347" 94..675 /gene="sodB" /note="b1656" 94..675 /gene="sodB" /EC number="1.15.1.1" /function="enzyme; Detoxification" /note="o193; 100 pct identical to SODF ECOLI SW: P09157 but includes initiator met; CG Site No. 15256; alternate name sodF" /codon start=1 /transl table=11 /product="superoxide dismutase, iron" /protein id="AAC74728.1" /db xref="GI:1787946" translation="MSFELPALPYAKDALAPHISAETIEYHYGKHHQTYVTNLNNLIK/ GTAFEGKSLEEIIRSSEGGVFNNAAQVWNHTFYWNCLAPNAGGEPTGKVAEAIAASFG SFADFKAQFTDAAIKNFGSGWTWLVKNSDGKLAIVSTSNAGTPLTTDATPLLTVDVWE HAYYIDYRNARPGYLEHFWALVNWEFVAKNLAA" repeat region 741..772 /note="REP (repetitive extragenic palindromic) element; contains 1 REP sequence" complement (837..2006) /gene="b1657" complement (837..2006) /gene="b1657" /function="putative transport; Not classified" /note="f389; residues 10-254 are 34 pct identical to aa8-252 from ARAJ ECOLI SW: P23910 (394 aa)" /codon start=1 /transl\_table=11 /product="putative transport protein" /protein id="AAC74729.1" /db xref="GI:1787947" /translation="MKINYPLLALAIGAFGIGTTEFSPMGLLPVIARGVDVSIPAAGM LISAYAVGVMVGAPLMTLLLSHRARRSALIFLMAIFTLGNVLSAIAPDYMTLMLSRIL TSLNHGAFFGLGSVVAASVVPKHKQASAVATMFMGLTLANIGGVPAATWLGETIGWRM SFLATAGLGVISMVSLFFSLPKGGAGARPEVKKELAVLMRPQVLSALLTTVLGAGAMF TLYTYISPVLQSITHATPVFVTAMLVLIGVGFSIGNYLGGKLADRSVNGTLKGFLLLL MVIMLAIPFLARNEFGAAISMVVWGAATFAVVPPLQMRVMRVASEAPGLSSSVNIGAF

by correlating it with other data. Comments to the authors are

```
NLGNALGAAAGGAVISAGLGYSFVPVMGAIVAGLALLLVFMSARKQPETVCVANS"
                complement (2099..2127)
promoter
                /note="factor Sigma70; predicted +1 start at 1735400"
promoter
                /note="factor Sigma70; promoter purR; documented +1
                at1735713"
protein bind
                2500..2516
                /note="central position to purR promoter:103.5"
                /bound moiety="PurR documented site"
                2560..\overline{3}585
gene
                /gene="purR"
                /note="b1658"
                2560..3585
CDS
                /gene="purR"
                /function="regulator; Purine ribonucleotide biosynthesis"
                /note="o341; 100 pct identical to PURR ECOLI SW: P15039;
                CG Site No. 17989"
                /codon start=1
                /transl table=11
                /product="transcriptional repressor for pur regulon, glyA,
                glnB, prsA, speA"
                /protein id="AAC74730.1"
                /db xref="GI:1787948"
                /translation="MATIKDVAKRANVSTTTVSHVINKTRFVAEETRNAVWAAIKELH
                YSPSAVARSLKVNHTKSIGLLATSSEAAYFAEIIEAVEKNCFQKGYTLILGNAWNNLE
                KQRAYLSMMAQKRVDGLLVMCSEYPEPLLAMLEEYRHIPMVVMDWGEAKADFTDAVID
                NAFEGGYMAGRYLIERGHREIGVIPGPLERNTGAGRLAGFMKAMEEAMIKVPESWIVQ
                GDFEPESGYRAMQQILSQPHRPTAVFCGGDIMAMGALCAADEMGLRVPQDVSLIGYDN
                VRNARYFTPALTTIHQPKDSLGETAFNMLLDRIVNKREEPQSIEVHPRLIERRSVADG
                PFRDYRR"
gene
                complement (3582..4514)
                /gene="ydhB"
                /note="b1659"
CDS
                complement (3582..4514)
                /gene="ydhB"
                /function="putative regulator; Not classified"
                /note="f310; 100 pct identical to YDHB_ECOLI SW: P37598"
                /codon start=1
                /transl table=11
                /product="putative transcriptional regulator LYSR-type"
                /protein_id="AAC74731.1"
                /db xref="GI:1787949"
                /translation="MWSEYSLEVVDAVARNGSFSAAAQELHRVPSAVSYTVRQLEEWL
                AVPLFERRHRDVELTAAGAWFLKEGRSVVKKMQITRQQCQQIANGWRGQLAIAVDNIV
                RPERTRQMIVDFYRHFDDVELLVFQEVFNGVWDALSDGRVELAIGATRAIPVGGRYAF
                RDMGMLSWSCVVASHHPLALMDGPFSDDTLRNWPSLVREDTSRTLPKRITWLLDNQKR
                VVVPDWESSATCISAGLCIGMVPTHFAKPWLNEGKWVALELENPFPDSACCLTWQQND
                MSPALTWLLEYLGDSETLNKEWLREPEETPATGD"
promoter
                complement (4550...4578)
                /note="factor Sigma70; predicted +1 start at 1737851"
promoter
                4558..4586
                /note="factor Sigma70; predicted +1 start at 1737901"
                4627..5838
gene
                /gene="ydhC"
                /note="b1660"
                4627..5838
CDS
                /gene="ydhC"
                /function="putative transport; Not classified"
                /note="o403; This 403 aa ORF is 90 pct identical (7 gaps)
                to 383 residues of a 400 aa protein YDHC ECOLI SW: P37597"
                /codon start=1
                /transl table=11
                /product="putative transport protein"
                /protein id="AAC74732.1"
                /db xref="GI:1787950"
```

```
translation="MQPGKRFLVWLAGLSVLGFLATDMYLPAFAAIQADLQTPASAVS/
                ASLSLFLAGFAAAQLLWGPLSDRYGRKPVLLIGLTIFALGSLGMLWVENAATLLVLRF
                VQAVGVCAAAVIWQALVTDYYPSQKVNRIFAAIMPLVGLSPALAPLLGSWLLVHFSWQ
                AIFATLFAITVVLILPIFWLKPTTKARNNSQDGLTFTDLLRSKTYRGNVLIYAACSAS
                FFAWLTGSPFILSEMGYSPAVIGLSYVPQTIAFLIGGYGCRAALQKWQGKQLLPWLLV
                LFAVSVIATWAAGFISHVSLVEILIPFCVMAIANGAIYPIVVAQALRPFPHATGRAAA
                LQNTLQLGLCFLASLVVSWLISISTPLLTTTSVMLSTVMLVALGYMMQRCEEVGCQNH
                GNAEVAHSESH"
                4629..4645
protein bind
                /gene="ydhC"
                /note="central position to predicted promoter:45.5"
                /bound moiety="RhaS predicted site"
                6008..6037
promoter
                /note="factor Sigma70; predicted +1 start at 1739352"
                6129..7277
gene
                /gene="cfa"
                /note="b1661"
CDS
                6129..7277
                /gene="cfa"
                /EC number="2.1.1.79"
                /function="enzyme; Fatty acid and phosphatidic acid
                biosynthesis"
                /note="o382; 100 pct identical to CFA ECOLI SW: P30010; CG
                Site No. 10810; alternate name cdfA"
                /codon start=1
                /transl table=11
                /product="cyclopropane fatty acyl phospholipid synthase"
                /protein id="AAC74733.1"
                /db xref="GI:1787951"
                translation="MSSSCIEEVSVPDDNWYRIANELLSRAGIAINGSAPADIRVKNP/
                {\tt DFFKRVLQEGSLGLGESYMDGWWECDRLDMFFSKVLRAGLENQLPHHFKDTLRIAGAR}
                LFNLQSKKRAWIVGKEHYDLGNDLFSRMLDPFMQYSCAYWKDADNLESAQQAKLKMIC
                EKLQLKPGMRVLDIGCGWGGLAHYMASNYDVSVVGVTISAEQQKMAQERCEGLDVTIL
                {\tt LQDYRDLNDQFDRIVSVGMFEHVGPKNYDTYFAVVDRNLKPEGIFLLHTIGSKKTDLN}
                VDPWINKYIFPNGCLPSVRQIAQSSEPHFVMEDWHNFGADYDTTLMAWYERFLAAWPE
                IADNYSERFKRMFTYYLNACAGAFRARDIQLWQVVFSRGVENGLRVAR"
gene
                complement (7317...7958)
                /gene="ribE"
                /note="b1662"
CDS
                complement (7317..7958)
                /gene="ribE"
                /EC_number="2.5.1.9"
                /function="enzyme; Biosynthesis of cofactors, carriers:
                Riboflavin"
                /note="f213; 100 pct identical to RISA_ECOLI SW: P29015;
                CG Site No. 11923"
                /codon start=1
                /transl table=11
                /product="riboflavin synthase, alpha chain"
                /protein id="AAC74734.1"
                /db xref="GI: 1787952"
                /translation="MFTGIVQGTAKLVSIDEKPNFRTHVVELPDHMLDGLETGASVAH
                NGCCLTVTEINGNHVSFDLMKETLRITNLGDLKVGDWVNVERAAKFSDEIGGHLMSGH
                IMTTAEVAKILTSENNRQIWFKVQDSQLMKYILYKGFIGIDGISLTVGEVTPTRFCVH
                LIPETLERTTLGKKKLGARVNIEIDPQTQAVVDTVERVLAARENAMNQPGTEA"
promoter
                complement (7998..8026)
                /note="factor Sigma70; predicted +1 start at 1741299"
                8111..8140
promoter
                /note="factor Sigma70; predicted +1 start at 1741455"
                8173..9546
gene
                /gene="ydhE"
                /note="b1663"
CDS
                8173..9546
                /gene="ydhE"
                /function="putative transport; Not classified"
```

```
/note="0457; 99 pct identical to fragment YDHE ECOLI
                     SW:P37340 (230 aa) but contains 227 additional C-ter
                     residues"
                     /codon start=1
                     /transl table=11
                     /product="putative transport protein"
                     /protein id="AAC74735.1"
                     /db xref="GI:1787953"
                     /translation="MQKYISEARLLLALAIPVILAQIAQTAMGFVSTVMAGGYSATDM
                     AAVAIGTSIWLPAILFGHGLLLALTPVIAQLNGSGRRERIAHQVRQGFWLAGFVSVLI
                     MLVLWNAGYIIRSMENIDPALADKAVGYLRALLWGAPGYLFFQVARNQCEGLAKTKPG
                     MVMGFIGLLVNIPVNYIFIYGHFGMPELGGVGCGVATAAVYWVMFLAMVSYIKRARSM
                     RDIRNEKGTAKPDPAVMKRLIQLGLPIALALFFEVTLFAVVALLVSPLGIVDVAGHQI
                     ALNFSSLMFVLPMSLAAAVTIRVGYRLGQGSTLDAQTAARTGLMVGVCMATLTAIFTV
                     SLREQIALLYNDNPEVVTLAAHLMLLAAVYQISDSIQVIGSGILRGYKDTRSIFYITF
                     TAYWVLGLPSGYILALTDLVVEPMGPAGFWIGFIIGLTSAAIMMMLRMRFLQRLPSAI
                     ILQRASR"
                     complement (9587..10843)
     gene
                     /gene="b1664"
     CDS
                     complement (9587..10843)
                     /gene="b1664"
                     /function="putative enzyme; Not classified"
                     /note="f418; This 418 aa ORF is 31 pct identical (50 gaps)
                     to 391 residues of an approx. 864 aa protein YEJO_ECOLI
                     SW: P33924"
                     /codon_start=1
                     /transl table=11
                     /product="possible enzyme"
                     /protein id="AAC74736.1"
                     /db xref="GI:1787954"
                     translation="MGSDAKNLMSDGNVQIVKTGEVIGATQLTEGELIVEAGGRAENT/
                     VVTGAGWLKVATGGIAKCTQYGNNGTLSVSDGAIATDIVQSEGGAISLSTLATVNGRH
                     PEGEFSVDKGYACGLLLENGGNLRVLEGHRAEKIILDQEGGLLVNGTTSAVVVDEGGE
                     LLVYPGGEASNCEINQGGVFMLAGKASDTLLAGGTMNNLGGEDSDTIVENGSIYRLGT
                     DGLQLYSSGKTQNLSVNVGGRAEVHAGTLENAVIQGGTVILLSPTSADENFVVEEDRA
                     PVELTGSVALLDGASMIIGYGAELQQSTITVQQGGVLILDGSTVKGDSVTFIVGNINL
                     NGGKLWLITDAATHVQLKVKRLRGEGAICLQTSAKEISPDFINVKGEVTGDIHVEITD
                     ASRQTLCNALKLQPDEDGIGATLQPA"
     promoter
                     complement (10887..10914)
                     /note="factor Sigma70; predicted +1 start at 1744188"
     promoter
                     complement (10926...10952)
                     /note="factor Sigma32; predicted +1 start at 1744227"
BASE COUNT
               2627 a
                        2894 c
                                 2660 g
                                          2852 t
ORIGIN
        1 tcatcttttg tctcaccttt taatttgcta ccctatccat acgcacaata aggctattgt
       61 acgtatgcaa attaataata aaggagagta gcaatgtcat tcgaattacc tgcactacca
      121 tatgctaaag atgctctggc accgcacatt tctgcggaaa ccatcgagta tcactacggc
      181 aagcaccatc agacttatgt cactaacctg aacaacctga ttaaaggtac cgcgtttgaa
      241 ggtaaatcac tggaagagat tattcgcagc tctgaaggtg gcgtattcaa caacgcagct
      301 caggtetgga accataettt etaetggaae tgeetggeae egaaegeegg tggegaaeeg
      361 actggaaaag tcgctgaagc tatcgccgca tcttttggca gctttgccga tttcaaagcg
      421 cagtttactg atgcagcgat caaaaacttt ggttctggct ggacctggct ggtgaaaaac
      481 agcgatggca aactggctat cgtttcaacc tctaacgcgg gtactccgct gaccaccgat
      541 gcgactccgc tgctgaccgt tgatgtctgg gaacacgctt attacatcga ctatcgcaat
      601 gcacgtcctg gctatctgga gcacttctgg gcgctggtga actgggaatt cgtagcgaaa
      661 aatctcgctg cataataact gatggcaaat gcagcattgc ctgaagcgct acgcttatca
      721 ggcctacgcg gatcatcgat gtaggtcgga taaggcactc gccgcatccg gcaagataaa
      781 tcgcacgttg tcagcaactg taacgcagaa ggttatcctt ctgcgttttt gtttaattag
      841 ctgttagcaa cgcaaactgt ttcaggttgt tttctggctg acataaacac cagcaataat
      901 gccagtcccg cgacaatcgc tcccatcacc ggcacaaagc tgtatcccag cccagcggaa
      961 attaccgcac caccagcage tgctcccage gcatttccaa gattaaagge accaatattg
     1021 actgatgaag acagacctgg cgcttcactg gcgacacgca tcacgcgcat ctgtaacggc
     1081 ggtacgaccg caaaggttgc tgcgccccac accaccatgc taatagctgc gccgaactca
     1141 ttgcgggcca ggaacgggat tgccagcata atcaccatca acaacaacaa aaagcctttc
     1201 aacgtgccgt taactgaacg atctgccagt ttgccgccga gatagttacc gatagagaat
```

1261 ccgacaccaa tcagcaccag cattgccgtg acgaacaccg gtgttgcgtg ggtaatactt 1321 tgcagtaccg gagagatata ggtgtagaga gtaaacattg caccagctcc cagtaccgtc 1381 gtcagcaatg cagacagcac ctgcggacgc attaataccg ccagctcttt tttcacttca 1441 ggtcgtgccc ctgcaccacc tttaggtaat gagaagaaca gacttaccat tgaaatcact 1501 cccaqccccq ccqttqccaq aaatqacatc cgccaqccqa tqqtttcacc caaccaqqtc 1561 gccgccggca cgccaccgat atttgccagg gttaacccca taaacatagt ggcaactgcg 1621 ctgqcctqtt tatqttttqq caccacqctt qcqqccacqa ctqaacccaa accaaaaaat 1681 gctccgtgat tcaggctggt caaaatgcgt gaaagcatca gggtcatata atccggcgcg 1741 atqqcqqaaa qtacqttqcc qaqcqtqaaa attqccatca ggaaaatcaa cgcactqcqq 1801 cqqqcacqat qaqaaaqtaq aagcgtcatc agcggcgcgc caaccattac gccaactgca 1861 taggcactga ttaacattcc ggcagcggga atcgagacat ccacaccgcg cgcaatgacg 1921 ggcaacaage ccattggcga gaactccgtt gtcccgatac caaacgcgcc aatcgccage 1981 gccagcaacg gatagttaat tttcatgcct tatctccacc tcttcgcgtc attacgcgat 2041 attcattaaa gtggcgaaag catgacagca atcacaaaaa aatgaaaata acaaaaagag 2101 aaaacacttt tgccattttg ctaacaaaca ggaaggagat gcgagggaga acgcgctccc 2161 tcgagaggaa atcagtgcag cgcggcagtc aaacccacgg ctacgatcaa accgaggacg 2221 ataatcgttg ttaccagtga aaatttaagg tcggtgctca tcaagttttc tcctttttta 2281 ttaccacaca aaaagtgata ttacgcattt ttacacactg tgatgaaaaa atctcccgtc 2341 atttataatg ataagtgttt ttaccacttc cccttttcgt caagatcggc caaaattcca 2401 cgcttacact atttgcgtac tggccattga ccccttcctg acgctccgtg tcgtttttcc 2461 ggcgtaccgc aacacttttg ttgtgcgtaa ggtgtgtaaa ggcaaacgtt taccttgcga 2521 ttttgcagga gctgaagtta gggtctggag tgaaatggaa tggcaacaat aaaagatgta 2581 gcgaaacgag caaacgtttc cactacaact gtgtcacacg tgatcaacaa aacacgtttc 2641 gtcgctgaag aaacgcgcaa cgccgtgtgg gcagcgatta aagaattaca ctactccct 2701 agcgcggtgg cgcgtagcct gaaggttaac cacaccaagt ctatcggttt gctggcgacc 2761 agcagcgaag cggcctattt tgccgagatc attgaagcag ttgaaaaaaa ttgcttccag 2821 aaaggttaca ccctgattct gggcaatgcg tggaacaatc ttgagaaaca gcgggcttat 2881 ctgtcgatga tggcgcaaaa acgcgtcgat ggtctgctgg tgatgtgttc tgagtaccca 2941 gagccgttgc tggcgatgct ggaagagtat cgccatatcc caatggtggt catggactgg. 3001 ggtgaagcaa aagctgactt caccgatgcg gtcattgata acgcgttcga aggcggctac 3061 atggccgggc gttatctgat tgaacgcggt caccgcgaaa tcggcgtcat ccccggcccg 3121 ctggaacgta acaccggcgc aggccgcctt gccggtttta tgaaggcgat ggaagaagcg 3181 atgatcaagg tgccggaaag ctggattgtg cagggtgact ttgaacctga atccggttat 3241 egegecatge ageaaateet gtegeageeg categeecta etgeegtett etgtggtgge 3301 gatatcatgg caatgggcgc actttgtgct gctgatgaaa tgggcctgcg cgtcccgcag 3361 gatgtttcgc tgatcggtta tgataacgtg cgcaacgcgc gctattttac qccggcqctq 3421 accacgatcc atcagccaaa agattcgctg ggtgaaacag cgttcaacat gctgttggat 3481 cgtatcgtca acaaacgtga agaaccgcag tctattgaag tgcatccgcg cttgattgaa [3541 egeogeteeg tggetgaegg ecegtteege gaetategte gttaateace egttgeggga 3601 gtctcttccg gctcccgcag ccactcctta ttcagcgtct cactatcgcc qaqatactca 3661 agcaaccagg ttaacgcagg cgacatatca ttttgctgcc atgtcagaca acatgccgaa 3721 teeggaaagg ggtttteeag ttetaatget acceaettee ceteattaag ceaeggtttg 3781 gcgaaatgtg ttggcaccat ccctatgcat aatcctgccg agatacaggt tgccgatgat 3841 tcccagtcag gcacgacaac tcttttttgg ttatccagca accaggtaat acgtttaggt 3901 agcgttcgcg aggtgtcttc gcgcaccaac gacggccagt tgcgcaacgt atcatcgctg 3961 aacgggccat ccatcaacgc cagcgggtgg tgactggcaa caacgcaact ccagcttagc 4021 atccccatat cccggaaggc ataacgaccg cctaccggaa tcgcgcgtgt tgcgccaatc 4081 gccagttcca cgcgcccgtc ggaaagcgca tcccagacac cgttgaacac ttcctgaaag 4141 acaagaagtt cgacatcatc aaaatggcga taaaaatcaa cgatcatctg ccgtgtacgt 4201 tetggeetga caatattate caetgegata getaactgae egegeeagee gttegetate 4261 tgctgacatt gctggcgggt gatctgcatt tttttgacaa cagagcgccc ttctttgaga 4321 aaccacgctc cagcagcggt cagctccaca tcacggtgcc gtcgttcaaa gagcggcacc 4381 gccagccact cttccagctg acgcacggta tagctgaccg cagaaggaac gcgatgcagc 4441 tectgtgeeg cagegetaaa actaecatta egegetaeeg cateaacaac ttegagtgaa 4501 tattctgacc acatagtctg cctgcaaaat ttttgaaacc agtcatcaaa tattaccgtt 4561 tcacaacact aatttcactc cctacacttt gcggcggtgt ttaattgaga gatttagaga 4621 atatacatgc aacctgggaa aagattttta gtctggctgg cgggtttgag cgtactcggt 4681 tttctggcaa ccgatatgta tctgcctgct ttcgccgcca tacaggccga cctgcaaacg 4741 cctgcgtctg ctgtcagtgc cagccttagt ctgttccttg ccggttttgc cgcagcccag 4801 cttctgtggg ggccgctctc cgaccgttat ggtcgtaaac cggtattatt aatcggcctg 4861 acaatttttg cgttaggtag tctggggatg ctgtgggtag aaaacgccgc tacgctgctg 4921 gtattgcgtt ttgtacaggc tgtgggtgtc tgcgccgcgg cggttatctg gcaagcatta 4981 gtgacagatt attateette acagaaagtt aaccgtattt ttgeggeeat catgeegetg 5041 gtgggtctat ctccggcact ggctcctctg ttaggaagct ggctgctggt ccatttttcc 5101 tggcaggcga ttttcgccac cctgtttgcc attaccgtgg tgctgattct gcctattttc

5161 tggctcaaac ccacgacgaa ggcccgtaac aatagtcagg atggtctgac ctttaccgac 5221 ctgctacgtt ctaaaaccta tcgcggcaac gtgctgatat acgcagcctg ttcagccagt 5281 ttttttgcat ggctgaccgg ttcaccgttc atccttagtg aaatgggcta cagccggca 5341 gttattggtt taagttatgt cccqcaaact atcqcqtttc tqattqqtqq ttatqqctqt 5401 cgcgccgcgc tgcagaaatg gcaaggcaag cagttattac cgtggttgct ggtgctgttt 5461 gctgtcagcg tcattgcgac ctgggctgcg ggcttcatta gccatgtgtc gctggtcgaa 5521 atcctgatcc cattctgtgt gatggcgatt gccaatggcg cgatctaccc tattgttgtc 5581 qcccaggcgc tqcgtccctt cccacacgca actggtcgcg ccgcagcgtt gcagaacact 5641 cttcaactgg gtctgtgctt cctcgcaagt ctggtagttt cctggctgat cagtatcagc 5701 acqccattqc tcaccaccac cagcqtqatq ttatcaacaq taatqctqqt cqcqctqqqt 5761 tacatgatgc aacgttgtga agaagttggc tgccagaatc atggcaatgc cgaagtcgct 5821 catagogaat cacactgate tatatogata tacttatact taggetgeta acaaaatttt 5881 gttgtatgat tgaaattage ggeetataet aatttegagt tgttaaaget aegataaata 5941 ttatgttttt acggggacag gatcgttccc gactcactat ggatagtcat ttcggcaagg 6001 gttcctcctt tccctctgtt ctacgtcgga ttatagactc gcggtttttt ctgcgagatt 6061 teteacaaag eecaaaaage gtetaegetg ttttaaggtt etgateaceg accagtgatg 6121 gagaaactat gagttcatcg tgtatagaag aagtcagtgt accggatgac aactggtacc 6181 gtategeeaa egaattaett ageegtgeeg gtatageeat taaeggttet geeeeggegg 6241 atattegtgt gaaaaaceee gattttttta aaegegttet geaagaagge tetttggggt 6301 taggcgaaag ttatatggat ggctggtggg aatgtgaccg actggatatg ttttttagca 6361 aagtettacg cgcaggtete gagaaceaac tececeatea tttcaaagae aegetgegta 6421 ttgccggcgc tcgtctcttc aatctgcaga gtaaaaaacg tgcctggata gtcggcaaag 6481 agcattacga tttgggtaat gacttgttca gccgcatgct tgatcccttc atgcaatatt 6541 cctgcgctta ctggaaagat gccgataatc tggaatctgc ccagcaggcg aagctcaaaa 6601 tgatttgtga aaaattgcag ttaaaaccag ggatgcgcgt actggatatt ggctgcgct 6661 ggggcggact ggcacactac atggcatcta attatgacgt aagcgtggtg ggcgtcacca 6721 tttctgccga acagcaaaaa atggctcagg aacgctgtga aggcctggat gtcaccattt 6781 tgctgcaaga ttatcgtgac ctgaacgacc agtttgatcg tattgtttct gtggggatgt 6841 tcgagcacgt cggaccgaaa aattacgata cctattttgc ggtggtggat cgtaatttga 6901 aaccggaagg catattcctg ctccatacta tcggttcgaa aaaaaccgat ctgaatgttg 6961 atccctggat taataaatat atttttccga acggttgcct gccctctgta cgccagattg 7021 ctcagtccag cgaaccccac tttgtgatgg aagactggca taacttcggt gctgattacg 7081 atactacgtt gatggcgtgg tatgaacgat tcctcgccgc atggccagaa attgcggata 7141 actatagtga acgctttaaa cgaatgttta cctattatct gaatgcctgt gcaggtgctt 7201 tecgegeeeg tgatatteag etetggeagg tegtgttete aegeggtgtt gaaaaeggee 7261 ttcgagtggc tcgctaaagg ctattctatc gccccctctc cgggggcgat ttcagatcag 7321 gcttctgtgc ctggttgatt catggcattt tctcgtgccg ccagcacacg ttctaccgta 7381 tctaccactg cctgagtttg tggatcgatt tcaatgttga cgcgtgcgcc aagttttttc 7441 ttcccaagag tcgtgcgttc cagtgtttcc ggaattaaat ggacgcaaaa acgcgttggc 7501 gtgacttcgc cgacggtcag gctaataccg tcgatgccaa taaatccttt gtacagaata 7561 tatttcatca actgactatc ctggacttta aaccagatct ggcgattatt ttctgaggtt 7621 aatattttcg ccacttcagc agtggtcata atatgacctg acattaagtg tccgccaatt 7681 tcatcactga atttcgccgc acgctcaacg tttacccaat ccccacttt taaatcgcca 7741 agattggtaa tgcgtaacgt ttctttcatc aggtcaaaac tgacatggtt gccgttaatt 7801 tecgteacgg teaggeagea acceptatge gecaeggaag caeeggttte eaggeegtee 7861 agcatgtggt cgggtaactc caccacatgc gtacgaaaat ttggtttctc gtcaatcgac 7921 accapttttg cggtgccctg tacaatcccc gtaaacatac ttacaactcc tgaaatcagt 7981 taagacattc tgttcagcac aatagcaggt ggaaaacgcc cttaccagtg aaggggtaag 8041 aatggctatt ttttcactgg agaattaata aatcctcgct acaatagact gaatttcccc 8101 tgcttcttct ttttgctgcc cattcaggcg gctttttagt ctctcatata actacaaata 8161 aaaggtgttc acgtgcagaa gtatatcagt gaagcgcgtc tgttattagc attagcaatc 8221 ccggtgattc tcgcgcaaat cgcccaaact gcgatgggtt ttgtcagtac cgtgatggcg 8281 ggcggctata gtgccaccga catggcggcg gtcgctatcg gtacttctat ctggcttccg 8341 gcgatcctct ttggtcacgg actgctgctg gcattaacgc cggttatcgc gcaattaaat 8401 ggttccggtc gacgtgagcg cattgcgcat caggtgcgac aaggtttctg gctggcaggt 8461 tttgtttccg ttctcattat gctggtgctg tggaatgcag gttacattat ccgctccatg 8521 gaaaacatcg atccggctct ggcggacaaa gccgtgggtt atctgcgtgc qttgttgtgg 8581 ggcgcccgg gatatctgtt cttccaggtt gcccgtaacc agtgtgaagg tctggcaaaa 8641 accaageegg gtatggtaat gggetttate ggeetgetgg tgaacateee ggtgaactat 8701 atctttattt atggtcattt cggtatgcct gagctcggtg gcgttggttg tggcgtggct 8761 actgcggcgg tgtattgggt catgttcctt gccatggttt cttacattaa acgcgcccgc 8821 tecatgegeg atattegtaa egaaaaagge acegeaaaae eegateetge ggttatgaaa 8881 cgactgattc aactcggttt gccgattgcg ctggcactgt tctttgaagt gacactgttt 8941 geegtegtgg etetgttagt gteteegete ggtattgttg atgtegeagg acaceagatt 9001 gccctgaact ttagttcact aatgttcgtg cttccaatgt cgctggcggc agcggtaact

```
9061 atccgcgtag gttatcgtct gggtcagggc tcaacgctgg atgcgcaaac cgctgcgcgg
     9121 acceptgctta tggtgggtgt ctgtatggca accetgacgg ccattttcac ggtttcactg
     9181 cgggagcaaa tcgccctgtt gtacaacgac aatcccgagg ttgtaacgct ggctgcgcat
     9241 ttgatgttgc tggcggcggt atatcagatt tctgactcaa tccaggtgat tggcagtggg
     9301 attttgcgtg gttataaaga tacgcgttcc attttctata ttacctttac ggcttactgg
     9361 gtgctgggct tgccaagcgg ctatattctg gcactgaccg atctggtcgt tgaacctatg
     9421 gggccagcag gcttctggat aggctttatt attggcctga cgtcggcagc cattatgatg
     9481 atgttgcgta tgcggttcct gcaacgtctg ccgtcagcca tcattctgca acgagcatcc
     9541 cgctaataaa gacaaggcgc aaccttcacg ggttgcgcct gtatttttac gcaggctgga
     9601 gcgttgcgcc aatcccgtct tcgtctggct gtaatttcag agcgttacac agagtttgcc
     9661 gactggcatc tgttatctca acgtgtatat ccccggtaac ttcccctttc acattgatga
     9721 agtcaggtga aatttetttt geaetggttt geaggeaaat egeteeetet eegegeagge
     9781 gtttcacttt cagttgcaca tgcgttgccg catcagtgat cagccacagt tttccaccat
     9841 tcagattgat gttaccaaca atgaaagtga cactgtcacc ttttaccgta ctgccgtcta
     9901 gaatcaacac accgccctgc tgtacagtaa tcgttgattg ttgcagctct gcgccataac
     9961 caataatcat tgaagcgccg tccagtaatg caacactccc ggtcagttca accggtgcgc
    10021 gatcttcctc tacgacaaaa ttttcgtccg cgctggtggg tgacaacagg atcactgtcc
    10081 caccttgtat taccgcgttt tccagcgtac cggcatgcac ttcagcccga ccacccacat
    10141 tcacggacag gttttgcgtc ttaccggaac tgtagagctg aaggccatcc gtccccagac
   10201 gataaatgga tccattctca acaatagtgt cagagtcttc accaccgaga ttattcatgg
    10261 tgccaccage aagcaacgta tcactggett teeeggeeag cataaaaaeg eegeeetgat
    10321 taatctcaca attgctggct tccccacctg gatacaccaa caattcacca ccttcatcta
    10381 ccacgaccgc tgaggttgtc ccattaacca acaggccgcc ctcttgatcg agaatgattt
    10441 tttccgcgcg atgtccttcc agtacacgca ggttaccgcc attttccagc aacaaaccgc
   10501 aggcataacc tttatcaacg ctgaattcac cttcgggatg gcggccatta accgtagcga
   10561 gcgtagagag actaattgcg cctccctcgg actgaacaat atctgtggca atggcaccat
   10621 cgctgaccga tagcgtgcca ttgttaccgt actgtgtgca tttggcgatc ccaccggttg
   10681 ccactttcaa ccagccagcc cccgtgacca cggtattttc ggctcttccg ccagcttcaa
   10741 caatcaactc gccttcagta agttgcgtcg cgccaatgac ctcgccggtc ttaacaattt
   10801 gcacgttccc gtcgctcatc aagtttttcg catcagatcc catgatttat tcctttgctg
   10861 catctgtgtg cctttattgc tacctaagtg taaaggctac ggaggattta tccacgacag
   10921 atttgagatg gtggcaaaca actctgttta aactctgata cacgaattat tgggttgtat
   10981 cagatgtaaa tgcgatcctg aataaaaatc acccttgcaa atcaacaaaa tat
//
```

Revised: July 5, 2002.

Disclaimer | Write to the Help Desk NCBI | NLM | NIH

Oct 21 2002 11:56:56